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TOPIC: ENGINEERING

# MANAGING BREWERY OPERATIONS DURING THE CONSTRUCTION PHASE

12 min read

Your brewery is a dynamic environment on the best of days with material supply challenges, production issues, and shifting customer orders which drive schedule changes. Now add in project impacts from construction – this provides yet another layer of complexity!

What are the critical aspects of the construction or implementation phase to be aware of so you can proactively control around operational impacts?

How should the brewery's operations integrate with the project implementation?

To get to the project construction or implementation phase, a brewery should already be well positioned after completing a comprehensive Project Plan and working out the details as part of the Design and Tendering Phase. Now is the time when the project becomes real – shifting from conceptual and theoretical to practical, physical work in the brewery through construction and implementation. Ensuring your operations are set up to smoothly coexist with the project is essential to keep your production on track.

## Figure 1





The following impacts are important for the brewery operations and the project team to jointly manage:

### <u>Safety</u>

Ensuring that everyone working in the brewery leaves work the same way they arrive should always be the top focus of any business. Adding construction work to the brewery adds additional risks due to the higher risk aspects that are inherently part of construction methods along with new hazards that are introduced due to construction. Appropriate integration and/or separation between brewery operations and construction needs to be well defined on a case-by-case basis.

To manage construction risks, the brewery should be monitoring construction activities daily. Many breweries will not have the necessary competency to address specific construction methods. There is a need to validate that proper approaches are always adhered to, and since the work is being completed on the brewery's property, it is prudent to manage against contractors taking undue risk since this risk could lead to injury or fatalities. No brewery wants to see any of these things happen! Hiring a local construction manager or site supervisor is a wise addition to the project team to ensure safety practices are followed along with keeping the project logistics and deliverables on track.

Construction Managers and Site Supervisors at experienced breweries will require construction contractors to complete safety permits and/or define detailed work plans for higher risk construction methods to document that contractors will follow safe practices and are certified to complete the work. Examples of these permits or work plans can include:

- · Working at Heights (e.g. work requiring a mobile lift, scaffold, or ladder)
- Hot Work (e.g. welding or metal grinding which creates higher fire risk)

• Electrical Work (e.g. Lock Out Tag Out (LOTO) to ensure circuits, panels, or equipment being worked on are deenergized to prevent electrocution risk)

• Rigging or Lifting Work (e.g. using a crane or equipment to lift heavy materials or equipment above ground

These permits or work plans should be refreshed any time the risk or work changes significantly throughout the construction phase.

Many countries, states or provinces have specific licenses or training certifications for construction workers to ensure they are competent in the work they are doing. The brewery should get a listing of all applicable licenses from the contractor's workers to ensure due diligence.

Personal protective equipment (PPE) that is not typical to the brewery (e.g. hard hats, construction safety boots, etc.) can be required for the brewery operations team if they need to enter the construction site. This requirement might be mandated by state or provincial law or just considered good practice to protect workers from hazards in the work environment. Ensuring this PPE is fitted and used properly by brewery employees may require some additional training for those not familiar with construction. As always, training records should be maintained.

"It can be surprisingly difficult to find a contractor whose safety culture aligns with that of the brewery" says Tim Wolf, Senior Advisor, Engineering Services. "Safety-driven operations have high expectations, and conversely other breweries may not be as aware of good safety practices. It can be equally challenging to bring construction contractors programs into alignment. In both cases, clear and ongoing communication is essential to managing construction safety—particularly in an operating brewery where production continues during construction and hazards evolve daily."

### <u>Quality</u>

Your brewery's brands and the quality beer you produce are your business' livelihood and thus you can't afford these to be impacted, even temporarily, by construction. It is critical for any construction contractors to understand how they can ensure no quality impacts are experienced within your processes. Awareness is a key aspect of supporting this. Construction workers are focused on construction, and many won't understand the brewing process and the many quality aspects that go into it. Having an upfront and ongoing discussion with the construction team will be critical so that any quality related conflicts can be eliminated in advance. Ensuring your construction site supervisor is aware of these quality impacts is important to ensure you have someone keeping an eye on the construction site acting essentially as an extension of your production quality team. Here are some quality focused construction techniques to consider:

- Separate construction and production areas using poly sheets, hoarding, temporary walls, etc. to prevent dust or debris from entering the production areas. This will help mitigate any risk of cross contamination, damage to product, or potential tampering.
- Good hygiene, cleaning, and material storage practices on the construction site are critical to prevent risk of dust and debris from getting into production areas.
- Chemicals or materials that create odors unacceptable for the production areas can be created by typical construction methods (e.g. painting, water proofing, etc.) so ensuring construction areas are well ventilated with temporary air handling equipment is important to mitigate these impacts.
- Exterior door / access control. Often construction requires bringing in equipment through temporary openings in walls or openings. It is important that these exposures are mitigated to prevent insects, rodents, weather or unwanted visitors from getting into the brewery.
- Access for production team members to get samples for quality checks must not be blocked or restricted by construction. Temporary restrictions to areas might be required or quality personnel might need to be safety trained and don construction PPE to enter the construction site to access the sample points required.
- Schedule more intrusive construction work around production shifts to avoid risk of contamination or other quality impacts. This could include intrusive impacts from a quality perspective (e.g. dust, fumes, asbestos removal) but also a Safety perspective (e.g. noise, lifting over occupied areas, etc.)
- Many process implementation projects require a surgical approach to existing, in-service process piping and equipment. Scheduling tie-ins (e.g. valves, instruments, etc.) and changes to process piping routing with sufficient time for validation and Clean In Place (CIP) are especially important to consider. Failure to plan this well can lead to your great beer touching unclean piping which could expose it to construction materials (e.g. grease, lubricants), metal shavings, microbial contaminants, or oxygen.

### Production Downtime

Mitigating construction impacts on production should have been discussed to some level in both the Planning Phase and Design Phase as schedules were being defined and fine-tuned. The goal should be to reduce the total hours of downtime the construction creates to allow the brewery to produce their great beers and beverages to satisfy customer orders. This may not be top of mind for the general contractor, so it is important to have a game plan to ensure this is carefully sequenced. Some options to consider to reduce production downtime include:

- Scheduling projects during shoulder season or slower sales periods when it is easier to schedule construction downtime without impacting production requirements.
- Scheduling projects during off shifts or weekends when production is not scheduled (although this comes at a premium cost)
- Breaking longerproject-related downtime periods into smaller, more surgical downtime periods that can allow for production to continue. This is especially useful in the brewing department since the brewing process is such a time sensitive one. For instance, instead of taking an entire fermenting cellar down at one time (which would impact overall capacity and risk losing yeast generations), one can break the scope down to address individual fermenters one by one or in groups.

#### Space, Logistics & Access

Space within the brewery is always a scarce resource and unfortunately construction projects can require significant areas for material laydown, fabrication and assembly, and for amenities for the construction workers like office and meeting spaces, washrooms and lunch areas. Up front planning with brewery operations is important to define specific spaces for construction and specific spaces for production.

For larger projects, the general contractor may bring a construction trailer to the brewery to provide temporary space for offices space, meeting space and lunchroom facilities for the trades. This can be a convenient way of temporarily creating additional space to support the needs of the project team without taking space away from the brewery. These trailers typically only require temporary electrical supply. Similarly, portable washrooms are a good option to consider as part of the overall project to minimize use of your brewery production or taproom washrooms when a large construction crew is assembled onsite.

As a project progresses, there is typically movement of materials and equipment related to construction within the footprint of the brewery which are important paths to plan out from both a safety and production perspective. The wrong movements can create risks to employees while also impeding material movements from production forklifts.

Breweries typically operate with a small team of brewers, packaging operators, warehouse staff and administration. Construction work can quickly multiply the number of people on the brewery property which adds risk and complexity of operations. Being upfront about areas that are permitted for construction workers, and which are not will set expectations in creating a safe and quality focused brewery during the construction activities. With more people onsite there is also heightened risk of inventory control to consider.

The impacts mentioned above should position the brewery to continue production while mitigating negative impacts from the Construction Phase. During construction adding experienced project management support to represent your interests during construction will ensure that your general contractor gets quick answers and that the right decisions are made in the field to avoid delays. First Key's technical team often provides the project management support outlined below so that the core brewery can maintain focus on high quality day-to-day operations.

**Change Orders (CO)** – as site conditions or new ideas create project scope changes it is important that these are documented and formally communicated. Some changes may create extra costs and others may yield savings from the initial scope.

**Request for Information (RFI)** – although the detailed design and tender documents can be well defined there can be questions or additional details that the contractor requires answers from the project team. Formally communicating and documenting these requests in a timely manner is important – some may prompt change orders. Delays in responding can result in construction delays and added costs.

**Frequent Site Tours** – the project manager should frequently tour the construction site to review progress and be visible in order to support the construction manager and their team. Unforeseen safety and quality impacts can also be identified from these walks so they can be addressed immediately.

**Routine Construction Team Meetings** – regularly pulling the project team together to review progress and work through coordination issues is a great way to ensure proper communication is happening. This type of routine meeting is the minimum and ideally contractors are collaboratively working together on the construction site daily.

**Contractor Management** – use of sign in/out logs to control access and ensure awareness of who is on site. Some breweries will require all contractors to complete a site orientation program to ensure all construction workers are aware of the critical aspects of working in a brewery (e.g. doing hot work near a malt mill, quality aspects and practices required, etc.).

**Communication Management** – keep all key stakeholders aware and informed about construction progress through signage, emails, etc. There will be considerable interest in the work being done and effective communication will aid in keeping people out of the construction site and away from risk. Transparent communication about the realities of construction and ensuring the right members of the brewery team are involved and aware is critical so there aren't surprises in the end.

**Schedule Management –** routine review and adjustment of the detailed project schedule with follow up communications to trades and project stakeholders as the project evolves.

**Budget Management** – routine cost trackingofthe project budget to ensure issues like change orders don't overexpose the brewery financially. Depending on project scope, budget management should be completed weekly or monthly involving all the key stakeholders.

The best practice is to engage the construction contractors in a way that they feel part of the brewery team and aligned to the brewery and project goals. Sharing a beer together to celebrate construction milestones is a great way to engage the team and build a collective mindset!

Although the Construction Phase is critical, the most critical outcome is that the new building, equipment or process delivers the new functionality required – bringing them to life!

This article is part of series from First Key on **Project Management Best Practices.** The final article will focus on **Leading the Brewery through the Project Commissioning & Startup Phase.**